

HOW I DO IT

Reconstruction of the Adductor Canal Following Resection of Sarcoma of the Anteromedial Thigh

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INTRODUCTION

Sarcomas of the anteromedial thigh are situated over or near the course of the femoral vessels. Resection of the sartorius muscle is often required. Development of flaps is also required in order to obtain a wide margin around the tumor mass in the subcutaneous fat. One of the risks of flap formation is postoperative flap necrosis. Necrosis of the edges of the flaps may lead to infection, debridement, and exposure of the vessels in an infected wound, posing the risk of bleeding from the vessels, and in the worst case scenario, may result in amputation. Coverage of the vessels with muscle flaps is desirable.

OPERATIVE TECHNIQUE

The patient is placed on the operating table in a supine position with the left thigh moderately abducted and externally rotated, having the knee supported with a pillow in the popliteal area. Following preparation and draping, an elliptical incision is made around any previous biopsy incision. Otherwise a straight, longitudinal incision over the middle of the bulge of the tumor mass is made.

Flaps are then developed, which are thin for ~4–5 cm and then become progressively thicker as the deep fascia is approached. The sartorius muscle is exposed proximally and distally. The intervening segment of this muscle often traverses the area of tissues occupied by the tumor. In this case, the sartorius is divided proximally and distally. The gracilis muscle at this level of the thigh is close to the sartorius and the area occupied by the tumor and may have to be divided proximally and distally. In the specific case presented as an illustration of the technique, the tumor was abutting against the surface of vastus medialis (Figs. 1 and 2). The fascia covering the vastus medialis was incised and dissection through the

muscle was carried out, leaving a thickness of ~2 cm from the muscle to be removed en bloc with the specimen. The nerve (a branch of the femoral) entering the proximal portion of this muscle was identified and the portion of it innervating the lateral portion of the muscle was preserved in the presented case. As the dissection continued, the lateral aspect of the superficial femoral vessels in the adductor canal was exposed. The adductor (Hunter's) canal has a triangular shape on cross section and is constructed of the vastus medialis medially, sartorius muscle anteriorly, and adductor longus-adductor magnus posteriorly. The superficial femoral vessels traversing the canal are covered anteriorly by a strong fascia extending transversely between the adductors and vastus medialis. As the dissection proceeded on the surface of the vessels, it was carried out in a plane posterior to this strong fascia. A small portion of the adductors from which this transverse fascia was emanating was removed. This exposed the medial aspect of the superficial femoral vessels. Small branches or tributaries from these vessels directed toward the specimen were ligated and divided flush with the surface of the vessels permitting the removal of the specimen (Figs. 3 and 4).

Interrupted sutures of 2-0 vicryl between the adductor longus and vastus medialis proximally, and adductor magnus and vastus medialis distally were placed. The fascia over the adductors was incised and the muscles mobilized sufficiently in order to permit their approximation with the vastus medialis without tension (Figs. 5 and 6). In other patients we have divided the insertion of adductors close to the linea aspera and mobilized the divided edge of these muscles to a plane anterior to the

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Fig. 1. Longitudinal view of the tumor on MRI scan.



Fig. 2. Transverse section of the mass showing that it was situated between vastus medialis anterolaterally and sartorius-gracilis-adductors posteromedially.

femoral vessels so as to provide coverage to the vessels. This interference with the anatomy of adductors causes no problem, since in our experience even complete resection of the medial compartment for sarcomas, causes

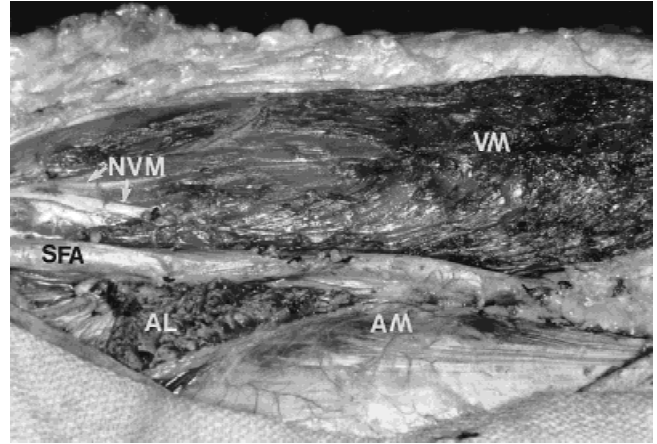


Fig. 3. The specimen has been removed. The cut surface of vastus medialis, at the top of the figure, is clearly visible. The superficial femoral vessels have been skeletonized. VM = vastus medialis, NVM = nerve branches to vastus medialis, SFA = superficial femoral artery, AL = adductor longus, AM = adductor magnus.

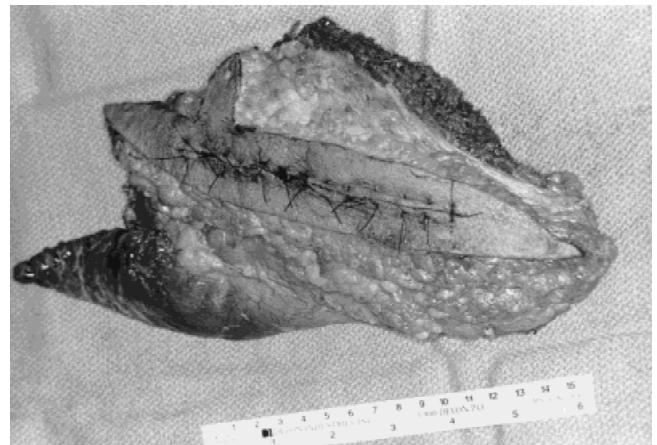


Fig. 4. The removed specimen. The previous incision and drain exit point have been removed en bloc with the remainder of the specimen. (Scale in cm and inches.)

no problem with routine activities, such as ambulation or walking up and down stairs [1].

As the sutures between adductors and vastus medialis are placed and tied, one should ascertain that they are not constricting the passage of the vessels in the reconstructed adductor canal. As soon as the operation is completed and while the patient is still on the operating table, the pedal pulses in both feet should be checked to make sure they are equal.

In conclusion, following resection of a sarcoma of the anteromedial thigh that involves skeletonization of the superficial femoral vessels or resection of the vessels and replacement with grafts [2], it is desirable to cover the vessels so that in the event of skin edge necrosis of the flaps or other breakdown of the incision, the vessels do not become exposed in a contaminated wound. There is usually enough laxity of tissues to permit tension-free

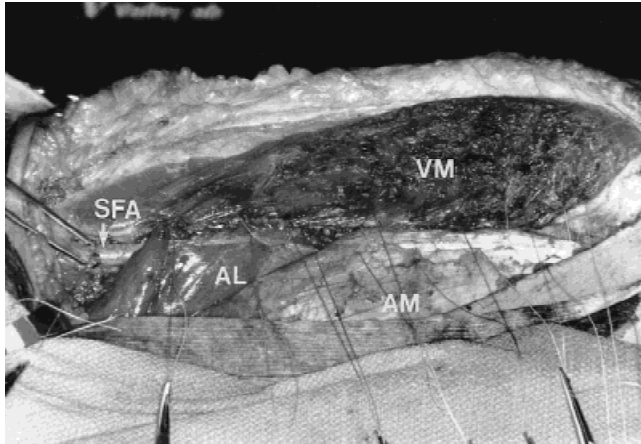


Fig. 5. Sutures have been placed between the adductor longus and remnant of the vastus medialis on the left of the figure, and between the adductor magnus (with aponeurotic surface) and the vastus medialis on the right of the figure. A small portion of the vessels is still visible at the left of the figure. (See abbreviations in Fig. 3.)

approximation of the vastus medialis and the adjacent adductors, thus reconstructing Hunter's canal, as in the case illustrated above. Occasionally, when a greater bulk of vastus medialis and/or the adjacent adductors has been resected, one has to divide the insertion of the remaining adductors along the linea aspera and suture their divided edge to the remaining quadriceps anterior to the vessels.

The above technique represents an easy method of

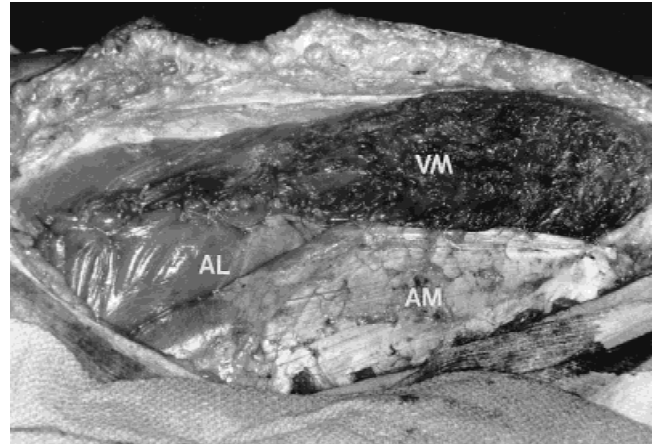


Fig. 6. The sutures have been tied approximating the adductors and remnant of the vastus medialis, thus reconstructing the adductor canal. (See abbreviations in Fig. 3.)

coverage of the femoral vessels following sarcoma resection, which is available when a portion of adductor muscles has been preserved.

REFERENCES

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